

DEFENSIVE PESSIMISM, STRATEGIC OPTIMISM,  
AND THE EFFECT OF OBSERVER EXPECTATIONS  
AND REFLECTIVITY ON TEST PERFORMANCE

Thesis

Submitted to

The College of Arts and Sciences of the  
UNIVERSITY OF DAYTON

In Partial Fulfillment of the Requirements for

The Degree

Master of Arts in General Psychology

by

Christina Marie Brown

UNIVERSITY OF DAYTON

Dayton, Ohio

April, 2005

THESIS

APPROVED BY:

Charles E. Kimble  
Faculty Advisor

David W. Biers  
Committee member and department chairperson

Robert J. Crutcher  
Committee member

David W. Biers  
Chair, Department of Psychology

## ABSTRACT

### DEFENSIVE PESSIMISM, STRATEGIC OPTIMISM, AND THE EFFECT OF OBSERVER EXPECTATIONS AND REFLECTIVITY ON TEST PERFORMANCE

Name: Brown, Christina Marie  
University of Dayton

Advisor: Dr. C.E. Kimble

Defensive pessimists are people who have typically done well on evaluations in some domain in the past, yet they expect to do poorly on future evaluations and they worry about what might go wrong. These two components of defensive pessimism—low expectations and negative reflectivity—help reduce defensive pessimists' pre-performance anxiety so they ultimately perform well. Strategic optimists are different from defensive pessimists in that they expect to do well in the future and they avoid thinking about what might happen, and they perform just as well as defensive pessimists. Defensive pessimists have been found to perform worse when another person says he or she expects them to do well, because this is inconsistent with their own expectations. This experiment was designed to test whether reflecting (i.e., thinking extensively) about an upcoming evaluation can counteract the negative effect of high expectations on defensive pessimists' performance. The effect of low expectations on defensive pessimists' performance, which has not been studied up to this point, was also examined. Ninety-six students at the University of Dayton who were classified as defensive pessimists or strategic optimists were told nothing about how they would do, or they were told that they were expected to do well or to do poorly. Half of all participants also wrote about their thoughts before taking an

analytical test. The effect of high expectations hurting defensive pessimists' performance was not replicated. It was found that low expectations tended to improve their performance, although this effect was not statistically significant. There was no main effect of pre-test reflection improving defensive pessimists' test scores. In fact, in contrast to what other researchers have found, there was a slight tendency for defensive pessimists to perform worse after reflecting. Similarly, the behavior of strategic optimists also did not conform to previous findings, because they tended to score higher after reflecting. For strategic optimists, reflecting before the test improved their performance to the extent that it was able to reduce how often they thought about the difficulty of the test while they were actually taking the test.

## ACKNOWLEDGMENTS

My special thanks go to Dr. Charles E. Kimble, my advisor, for supervising this thesis project and providing immeasurable guidance throughout the process.

I would also thank to thank Kathleen L. Gauder for her assistance with data collection, Jesse L. Walker for creating the computer system used to collect participants' responses during the experiment, and Dr. David W. Biers and Dr. Robert J. Crutcher for their helpful feedback and suggestions about the procedure, design, and analyses of this study.

## TABLE OF CONTENTS

ABSTRACT.....	iii
ACKNOWLEDGEMENTS.....	v
LIST OF TABLES.....	viii
LIST OF FIGURES.....	ix
CHAPTER	
I. INTRODUCTION.....	1
Defensive Pessimism and Other Strategies.....	3
Defensive Pessimism versus Strategic Optimism.....	3
Defensive Pessimism versus Depression and Self-Handicapping.....	6
Components of Defensive Pessimism.....	8
The Benefit of Reflecting.....	9
Reflectivity as Prefactual Thought.....	14
Reflectivity and Negative Moods.....	15
Overview of the Present Study.....	16
I. METHOD.....	20
Participants.....	20
Measures.....	20
The Revised Defensive Pessimism Questionnaire.....	20
Selection of Defensive Pessimists and Strategic Optimists.....	22
Procedure.....	22
Observer-Expectancy Manipulation.....	23
Reflectivity Manipulation.....	24
Pretest Measures.....	25
Performance Measure.....	25
Posttest Measures.....	26
III. RESULTS.....	28
Manipulation Check: Strategy Classification.....	28

III. RESULTS, cont.

The Interaction of Strategy Type and Reflectivity on Test Performance.....29

Defensive Pessimists.....30

    Main Analysis: Reflectivity and Expectancy on Test Performance.....30

    Linear Regression to Predict Percentage Correct.....34

Strategic Optimists.....35

    Main Analysis: Reflectivity on Test Performance.....35

    Linear Regression to Predict Percentage Correct.....36

Analysis of Reflections.....37

IV. DISCUSSION.....40

Observer Expectations and Defensive Pessimists’ Performance.....40

The Effect of Reflectivity: Defensive Pessimists versus Strategic Optimists.....40

REFERENCES.....49

APPENDICES

A. The Revised Defensive Pessimism Questionnaire (Norem, 2001).....53

B. Sample Problem.....54

C. Analytical Test.....55

D. Examples of Reflection Statements.....61

## LIST OF TABLES

1. Defensive Pessimists' Mean Percentage of Correct Answers by Expectancy and Reflectivity Condition.....31
2. Strategic Optimists' Mean Percentage of Correct Answers by Reflectivity Condition....35



## LIST OF FIGURES

1. The Average Percentage of Correct Answers on the Test By Strategy Type and Reflectivity Condition.....30
2. Defensive Pessimists' Average Percentage of Correct Answers By Reflectivity and Expectancy Conditions.....32

## CHAPTER I

### INTRODUCTION

The night before a test, you can find some students studying madly while fretting about what an awful grade they will get, other students studying madly but confident that they will pull it off, and still others who are not studying at all. People use different strategies to deal with evaluative situations like tests, and some of these strategies are healthier than others. Certain strategies motivate the individual to work harder so the evaluation will turn out well, while other strategies involve risking a poor evaluation as a way to keep the individual's own thoughts and feelings about him- or herself positive. Not every person uses a strategy, and the type of strategy they choose often depends on the specific domain and their initial level of anxiety and confidence.

However, for people who do use a strategy consistently, studying that strategy and how they use it can help us understand why certain strategies are beneficial and whether their effectiveness can extend to other situations. Defensive pessimism and self-handicapping are two strategies for dealing with evaluative situations that an individual is worried about. Strategic optimism is a third strategy for approaching evaluative situations, but it is used by people who do not feel stressed about the situation and need to prevent anxiety from developing.

Defensive pessimism and self-handicapping are different strategies than strategic optimism because they are both believed to be motivated by some kind of anxiety about the situation and one's ability to do well or to avoid failure (Norem, 2001; Martin, Marsh, & Debus,

2001a, 2001b, 2003; Oleson, Poehlmann, Yost, Lynch, & Arkin, 2000). Strategic optimists do not doubt their ability to do well, but they are still using a strategy in evaluative situations: In order to do well, they must avoid all thoughts about possible outcomes, particularly negative ones, because to think about the situation would produce anxiety where there was none previously (Norem & Illingworth, 1993). A person may use all three of these strategies in different areas of life, depending on the situation and whether they are confident or concerned about how they will do (Norem, 2001). For example, one person may self-handicap in school, while taking a strategically optimistic approach to sports and a defensively pessimistic approach to social situations. The focus of the present study is defensive pessimism, although some attention is given to strategic optimism—its opposite—because the two are usually studied simultaneously for comparison.

Defensive pessimism involves setting low expectations about the outcome and ruminating about negative possibilities of the situation (Norem, 2001). People who use defensive pessimism do so because they are anxious about how they will do, and expecting the worst and imagining what can go wrong helps motivate them to prepare (Norem & Cantor, 1986b). Defensive pessimists have done well in the past but continue to have low expectations because this strategy helps them do well in situations they are anxious about (Norem & Cantor, 1986b). In contrast, strategic optimists have also done well in the past, but they do not feel anxious about future situations and are free to expect the best (Norem, 2001). While a defensive pessimist ruminates about the upcoming evaluation, a strategic optimist is carefree and prepares while avoiding thoughts about the outcome. Both defensive pessimists and strategic optimists perform well because defensive pessimists are anxious and their strategy motivates them to work harder,

while strategic optimists' strategy helps them avoid anxiety that would otherwise disrupt their performance (Norem, 2001; Norem & Illingworth, 1993; Spencer & Norem, 1996).

This study was designed to explore defensive pessimists' rumination and how they respond to the expectations other people have for them. I was also interested in examining defensive pessimists' tendency to think extensively about upcoming evaluations, and whether this extensive thinking might help them restore balance after an observer has tried to interfere with their strategy.

### *Defensive Pessimism and Other Strategies*

The first experiments on defensive pessimists (Norem & Cantor, 1986a, 1986b) compared them to people with similar histories of success but optimistic expectations, and the term "strategic optimism" was developed later to refer specifically to optimistic individuals who must also avoid thinking about the upcoming situation (Spencer & Norem, 1996). Most of the research has focused on defensive pessimists with strategic optimists as a secondary interest, although both groups are similar because they have done well in the past and continue to do well because of their respective strategies (Norem, 2001). Aside from strategic optimism, defensive pessimism has also been compared to depression and self-handicapping, so that literature will be discussed briefly.

### *Defensive Pessimism versus Strategic Optimism*

The first published experiment on defensive pessimism and strategic optimism was by Norem and Cantor (1986a). They sought to test the prediction that people holding strategically low expectations would not need to cognitively restructure a situation after failure, whereas people with optimistic expectations would use a "'post hoc' strategy" (p. 350) by making ego-

protecting attributions after failure. Optimists should deny having control over the event if they failed, but defensive pessimists should not display this attributional egotism because their low expectations should have already cushioned the blow of failure.

To test this, Norem and Cantor (1986a) prescreened participants for strategy type by asking them to rate the accuracy of eight statements about their behavior in academic situations, such as “I go into academic situations expecting the worst, even though I know I will probably do OK,” and “I often think about what it will be like if I do very well in an academic situation.” Their score was computed by subtracting their answers on the pessimistic items from their answers on the optimistic items. An additional statement, “I’ve generally done pretty well in academic situations in the past,” was included to identify defensive pessimists (as opposed to realistic pessimists or depressives) and realistic optimists (instead of illusory optimists) for participation in the experiment.

Prescreened defensive pessimists and optimists were asked to indicate how well they expected to do on an anagram task, completed the task, and received false success or failure feedback. Later they indicated how well they expected to do on a second anagram task, and then they completed the second task and answered a posttest questionnaire about their performance, their satisfaction with their performance, and their feelings of control over their performance. Participants’ expectations before the first and second task confirmed the accuracy of the optimism/pessimism prescreening, but the actual performance of optimists and defensive pessimists was not different. As predicted, optimists used a post hoc cushioning strategy by reporting less control after failure than after success. In contrast, defensive pessimists accepted control after both success and failure, and they reported feeling just as satisfied after success as the optimists did. Therefore, this initial work established the existence of the strategy of

“defensive pessimism,” in which a person sets low expectations despite past success, and attributional egotism is unnecessary to cushion self-esteem in the event of failure.

To demonstrate that defensive pessimism is an effective strategy for the people who choose to use it, Norem and Cantor (1986b) interfered with the strategy and found that it affected the performance and attributions of defensive pessimists. Academic defensive pessimists and optimists were identified by selecting students’ whose scores on the questionnaire from the previous study (Norem & Cantor, 1986a) were in the upper and lower thirds, respectively. Defensive pessimists’ strategy was interfered with by having an encouragement condition, where the experimenter was informed of the participant’s GPA and told the participant that he or she would probably do well on an upcoming anagram task and should be confident, considering his or her GPA. They found that defensive pessimists in the encouragement condition performed significantly worse on the anagram task than defensive pessimists who did not receive encouragement (there were no differences between encouraged and nonencouraged optimists, nor nonencouraged optimists and nonencouraged defensive pessimists). In addition, for optimists and encouraged defensive pessimists, there was a positive correlation between participants’ perceptions of their own performance and how much control they felt they had over their performance. In other words, they would accept control for their results if they had done well, but they would deny it if they had done poorly. This correlation represents attributional egotism, which the first study by Norem and Cantor (1986a) found is not typically used by defensive pessimists. However, defensive pessimists displayed the same attributional egotism that optimists did when their strategy was disrupted by encouragement.

Setting low expectations is believed to help defensive pessimists feel less anxious, and the experimenter’s encouragement in the form of high expectations most likely undid the anxiety

reduction because it made the defensive pessimists notice how their strategically low expectations were inconsistent with their past successes. As a consequence, these defensive pessimists performed worse and showed attributional egotism, suggesting that defensive pessimism—when the strategy is not interfered with—does indeed eliminate the need for ego-protecting attributions because it cushions the individual in advance.

In discussing these findings, Norem and Cantor (1986b) theorized that defensive pessimism is an effective strategy for some people who are anxious because anxiety causes a person to have thoughts irrelevant to the task at hand, and the strategy helps bring the individual's thoughts back to the task. Defensive pessimists have been considered an anomaly because earlier research has shown that low expectations become a self-fulfilling prophecy when they are stated explicitly (Campbell & Fairey, 1985; Dweck & Gilliard, 1975; Sherman, Skov, Hervitz, & Stock, 1981); yet for defensive pessimists, their strategy works because it helps them overcome their anxiety and motivates them to work harder. On the other hand, strategic optimists are not anxious about the situation so there is nothing affecting their motivation to prepare.

#### *Defensive Pessimism versus Depression and Self-Handicapping*

It is important to recognize that defensive pessimism is a strategy and is distinct from dispositional pessimism and depression. For example, Showers and Ruben (1990) compared the expectations and anxiety of defensive pessimists and mildly depressed students two weeks before, one day before, and two weeks after a stressful event. The defensive pessimists and depressives were just as anxious before the event and had similar low expectations, but the defensive pessimists reported spending more time preparing for the event (in this case, having specific thoughts about the event was considered preparation). Defensive pessimists' anxiety remained stable from two weeks before the event to one day before the event, while depressives'

anxiety increased significantly the day before the event. In addition, while the defensive pessimists thought extensively about details *before* the event, only the depressed students continued to dwell on the situation two weeks after it had passed. Therefore, defensive pessimism, with its greater preparatory effort and less unhealthy rumination afterwards, is clearly different from depression, despite the low expectations and anxiety of people in both groups.

Defensive pessimism has also been compared to self-handicapping, which is when a person is uncertain about whether he or she will perform well and does not want others to interpret poor performance as a sign of inability, so he or she creates or claims obstacles that might prevent success (Berglas & Jones, 1978). As a result, failure can be blamed on these additional factors—such as alcohol or a lack of practice—instead of lack of ability (Berglas & Jones). Martin, Marsh, and Debus (2001a) conceptualized self-handicapping and defensive pessimism as both being essentially motivated by a desire to protect one's self-worth from failure: self-handicappers do this by blaming failure on something outside of the self, and defensive pessimists prepare themselves for failure and lower their standards so failure won't have the same impact. In addition, Martin, Marsh, and Debus sampled college students and found that a high level of uncertainty about how much control one has over avoiding failure was highly related to both self-handicapping and defensive pessimism.

While the two strategies seem to have similar motivational origins, they result in very different behaviors and outcomes. Self-handicappers risk failure by withdrawing effort or seeking situations where success is difficult, while defensive pessimists think through possible scenarios and increase their preparation. When directly comparing students using the two different strategies, self-handicappers have been found to do worse on exams and have lower GPAs in college (Elliot & Church, 2003), while defensive pessimists pass more of their courses



(Eronen, Nurmi, & Salmela-Aro, 1998). In addition, adolescent defensive pessimists are observed as having more positive well-being, better school adjustment, and higher grades (Määttä, Stattin, & Nurmi, 2002). Defensive expectations and extensive thinking (reflectivity) have been examined separately, and defensive expectations have been found to lead to negative academic outcomes while reflectivity is associated with achievement (Martin, Marsh, & Debus, 2001a, 2001b, 2003). Therefore, the extensive rumination before a situation seems to be the component of defensive pessimists' strategy that is responsible for their success, because low expectations alone can be debilitating. In these same studies, self-handicapping and low expectations were related to similar feelings and outcomes, which adds further support to the view that defensive pessimism and self-handicapping—while similarly motivated—have very different outcomes because of the unique reflectivity component of defensive pessimism that leads to preparation and taking control of the situation.

### *Components of Defensive Pessimism*

Although the initial work on defensive pessimism focused on low expectations as the essential characteristic of the strategy, further research has found that there are actually two components to defensive pessimism: low expectations and reflectivity (Norem, 2001). Reflectivity is the extensive thinking that defensive pessimists engage in before a stressful event, and it is also known as mental rehearsal. Defensive pessimists are more likely to reflect about both positive and negative possibilities than strategic optimists are (Norem, 2001), but negative reflectivity is more beneficial for defensive pessimists' performance than positive reflectivity (Showers, 1992; Spencer & Norem, 1996). It is believed that the first component, low expectations, serves a self-protective goal because it prepares the individual to deal with failure;

the second component, negative reflectivity, has a motivational purpose because imagining what can go wrong motivates the individual to prepare so these negative scenarios can be prevented (Showers, 1992; Showers & Ruben, 1990). One of the main purposes of the present experiment was to see if defensive pessimists' tendency to reflect could be taken advantage of by encouraging reflectivity in a negative situation. Therefore, the focus will now be turned to the reflectivity component and the research that has already been done.

### *The Benefit of Reflecting*

Showers (1992) used social defensive pessimists and social optimists to examine the effect of negative reflectivity. The theory was that imagining negative possibilities is beneficial for defensive pessimists because the imagined possibilities are so terrible that people are motivated to work harder so they won't come true. Concrete, specific thoughts are more beneficial than general negativity because they provide material for creating a plan of action. Showers hypothesized that a negative focus of thoughts would help defensive pessimists feel better and perform well, although low expectations would not be necessary. Detailed negative thoughts alone should motivate the individual, while explicitly setting low expectations in the absence of reflecting could lead to expectancy confirmation. However, no differences were found between defensive pessimists who were or were not asked to state their expectations explicitly, so, in this case, defensive pessimists do not seem susceptible to expectancy confirmation (Showers, 1992, Study 1).

Showers (1992, Study 1) proceeded to test the effect of imagining possibilities with a positive or negative focus on defensive pessimists and optimists in social situations. Female introductory psychology college students who were prescreened for social defensive pessimism or optimism were told that the study would require them to spend ten minutes acquainting

themselves with another participant, who was a female confederate. Before the conversation, participants were asked to rate the likelihood of twelve statements describing what might happen during the conversation, and the statements were either all positive or all negative possibilities. An example of a positive-focus statement is, "It is easy to talk to each other," while a negative-focus statement would be, "There are long, awkward silences." The actual conversation lasted five minutes and was videotaped, and both participants and confederates rated their opinions of the outcome and their impressions of their partner.

Defensive pessimists in the negative focus condition spent more time talking and received more favorable ratings from the confederates than positive-focus defensive pessimists, while focus had no effect on optimists. The explanation for this outcome was that imagining negative possibilities motivated the defensive pessimists to exert more effort into making the conversation turn out well; however, their extra effort seemed to drain them emotionally, because these participants also felt worse after the conversation.

Negative-focus defensive pessimists were also viewed by confederates as more friendly and comfortable, so a second study was conducted to examine how a negative focus helps defensive pessimists prepare. Showers (1992, Study 2) posited that the way defensive pessimists benefit from the negative thoughts may be similar to what happens in theories of reactance-helplessness and self-affirmation, which propose that people try to recover from unfavorable situations by acting or thinking in positive ways. Showers predicted that confronting negative possibilities causes defensive pessimists to react by having more positive thoughts and feelings as they try to emotionally and behaviorally prepare themselves. On the other hand, an initial positive focus is inconsistent with their typical strategy and this discrepancy may leave them even more aware of their anxiety and worries.

After instructions and a focus manipulation that were identical to the previous study (Showers, 1992, Study 1), social defensive pessimists and optimists were asked to list all of the thoughts they had been having during a three-minute solitary wait. Participants were also asked to indicate their expectations and how much control they felt they would have over the situation, although the conversations ultimately never took place. Interestingly, defensive pessimists who had been asked to contemplate the likelihood of negative possibilities (negative focus condition) were in a more positive mood, felt more prepared and relaxed, wrote more positive thoughts about themselves, and had higher expectations about the conversation than defensive pessimists in the positive focus condition. There were no differences between optimists in the two focus conditions. Ironically, defensive pessimists' strategy of thinking through negative possibilities appears to leave them feeling more prepared and emotionally ready for the stressful event. If defensive pessimists are forced to think in a way that is inconsistent with their strategy (positive focus condition), then they will continue to feel anxious and unprepared. Therefore, even though their initial thoughts and expectations are negative, defensive pessimists may enter the stressful situation feeling more positive and prepared because their strategy has reduced their anxiety.

The importance of reflectivity for defensive pessimists was also demonstrated by two studies by Norem and Illingworth (1993), although they addressed reflectivity in general instead of negative reflectivity in particular. In Norem and Illingworth's first study, reflectivity was manipulated by having participants in a thought-listing condition complete a questionnaire that asked them to consider things like the best and worst possible outcomes and how they might feel given such outcomes. On the other hand, participants in a distraction condition performed an irrelevant manual task. Participants were told they would be listing their thoughts or working on the irrelevant task, their mood was assessed, and then they actually listed their thoughts or

performed the task. Next, their anxiety was measured, they performed a mental arithmetic task that they believed was the focus of the experiment, and finally they completed a posttest questionnaire that included items such as their perception of their performance and how much control they felt they had over their performance.

After being told that they would have to write out their thoughts or perform a different task before the main one, defensive pessimists in the distraction condition were in a significantly more negative mood than defensive pessimists in the thought-listing condition, while the opposite was true for optimists in the thought-listing condition compared to optimists in the distraction condition. Therefore, people seem to be aware of their own strategies to some degree, because they feel worse when they anticipate having to do something that is inconsistent with their own strategy. Defensive pessimists and optimists also performed better on the mental arithmetic task when they were in the condition that matched their strategy, although these differences were not statistically significant. However, performance on mental arithmetic problems may be determined more by ability than anxiety, so perhaps the differences would have been statistically significant if the task was different. For this reason, the type of performance task that was used in the current study was carefully considered.

Although actual performance was not significantly different, defensive pessimists felt better about their performance and felt they had more control over their performance after the thought-listing task than after the distraction task. Optimists, on the other hand, felt worse about their performance and were less satisfied after the thought-listing task than the distraction task. For defensive pessimists, it seems that reflectivity functions by controlling their anxiety so it doesn't disrupt their performance. Not only were defensive pessimists less anxious in the thought-listing condition, but the interaction between condition and strategy disappeared when

anxiety was a covariate, which suggests that the reduction in anxiety is indeed responsible for defensive pessimists' improved performance after reflectivity.

In their second study, Norem and Illingworth (1993) used an experience-sampling methodology and had defensively pessimistic or optimistic nursing students routinely reflect on their progress towards their goals. Consistent with the laboratory studies, the defensive pessimists felt better when they had to make routine progress reports that required them to reflect, while the optimists felt better when they did not have to make such reports. The results of these two studies support the theory that reflectivity, in particular, is an essential part of defensive pessimists' strategy. As they put it, "this thinking-through process functions as a way for them to acknowledge their apprehensions and negativity and then cognitively work through it," so the "defensive pessimists feel better, feel less anxious and more in control, and their performance should thus be less likely to be disrupted by anxiety" (p. 823). Norem and Illingworth were also the first to propose that *not* thinking about possibilities for an upcoming stressful situation is an essential part of the optimists' strategy, because they do not feel anxious and any type of reflectivity could create anxiety that they might have been denying or discounting before.

This prediction was supported by their study and another experiment by Spencer and Norem (1996), who had recreational defensive pessimists and optimists engage in a dart-throwing task after listening to guided imagery tapes. Defensive pessimists performed best after a coping imagery tape that described mistakes and imagined ways to correct them (which is similar to their natural negative reflectivity), while optimists performed best after a relaxation condition (which did not describe the task at all). Optimists performed the same in a mastery condition (imagining a perfect performance) as they did in the coping condition, so the evidence

does suggest that strategic optimism is not simply the opposite of defensive pessimism—having high expectations and imagining positive possibilities—but actually involves avoiding reflection or distracting oneself before an evaluation.

### *Reflectivity As Prefactual Thought*

Research has also been done on the prefactual and counterfactual thoughts—mental simulations before and after an event, respectively—of defensive pessimists and optimists. Both prefactual and counterfactual thoughts are simulations about possible alternative outcomes, so prefactual thinking is essentially a form of reflectivity (Sanna, 1996). According to Sanna, the type of prefactual thinking that is similar to defensive pessimists’ negative reflectivity is known as upward prefactuals, which are thoughts that consider how the *possible* outcome could be better. Upward counterfactuals are thoughts about how the *actual* outcome might have been better, while downward prefactuals and counterfactuals have to do with how the possible or real outcome could be worse. Sanna (1996, Study 1, Study 2) found that defensive pessimists were more likely to make upward prefactuals before an evaluation—which may motivate an individual to prepare because they focus on how the situation could be better—while optimists are more likely to make downward counterfactuals after an evaluation—which produces positive affect because it is comforting that it “could have been worse.” Although prefactual thoughts are different than thinking through possible outcomes (reflectivity) and counterfactual thoughts are not identical to post hoc attributions about personal control, they are used similarly by defensive pessimists and optimists: Defensive pessimists will think more negatively about a situation beforehand so they are emotionally prepared if it doesn’t go well, while optimists wait until the situation is over and make comforting attributions or counterfactuals if the outcome was unpleasant.

Similar to Showers' (1992) and Spencer and Norem's (1996) findings that defensive pessimists perform better in conditions with a negative focus, Sanna (1998, Study 1 and Study 2) found that defensive pessimists performed better on anagram tasks when they were induced to be in a negative mood than a positive mood. However, all individuals generate more upward prefactuals when they are in a negative mood, so a negative mood must have helped defensive pessimists' performance because it led to more upward prefactuals. In fact, the number of upward prefactuals—essentially, the amount of negative reflectivity—was positively related to defensive pessimists' performance. In addition, the relationship between defensive pessimists' upward prefactual thoughts and their performance was found not only when participants were prompted specifically for their prefactual thoughts (Study 1), but even when they were simply asked to write about their performance on the upcoming anagram task (Study 3). Optimists also generated more upward prefactuals when they were induced to be in a negative mood, but this was negatively related to their performance in that condition (Study 1). When they were not specifically prompted for their prefactual thoughts but had to write about their performance spontaneously, optimists' natural approach was to report little prefactual thinking at all (Study 3). However, when defensive pessimists are prompted for downward prefactuals (positive reflectivity) or prevented from engaging in any prefactual thought by occupying them with a distraction task, their performance on a subsequent anagram task suffers (Sanna, 1996, Study 2).

The research by Showers (1992), Norem and Illingworth (1993), Spencer and Norem (1996), and Sanna (1996, 1998) are strong support for the view that reflectivity helps defensive pessimists, most likely because it reduces their anxiety; distraction, on the other hand, helps strategic optimists because it avoids bringing attention to potential anxiety. One issue that has



been addressed only briefly in past research is whether reflectivity helps reduce defensive pessimists' anxiety because it gives them a sense of control over the situation. Norem (2001) believes that defensive pessimists feel that they have more control because of their low expectations and reflectivity, and both Norem and Cantor (1986b, Study 2) and Norem and Illingworth (1993, Study 1) found that defensive pessimists did report feeling more in control, according to posttest questionnaires, after reflecting or in conditions where their strategy had not been disrupted. The theory is that defensive pessimists feel they have little control over a stressful situation and they believe their strategy will help them have more control (Showers & Ruben, 1990). Whether reflectivity, in particular, can help them regain control when their strategy has already been interfered with was of interest in the present study.

### *Overview of the Present Study*

One of the first discoveries about defensive pessimists was that their performance suffers when someone else reports having high expectations for them (Norem & Cantor, 1986b). This performance impairment may be because the high expectations are inconsistent with their own low expectations (Norem & Cantor, 1986b). Their strategy is disrupted—which subsequently affects their performance—because the inconsistency caused by the experimenter's verbal encouragement is believed to “undo” the anxiety reduction achieved by strategically setting low expectations (Norem & Cantor, 1986b). If another person's high expectations cause anxiety because they don't match the defensive pessimist's own expectations, then perhaps giving a defensive pessimist time to reflect—the other component of their strategy that helps reduce anxiety—can restore the imbalance caused by an observer's expectations. There is support for the proposal that thinking through possible outcomes, particularly negative ones, is the part of

defensive pessimists' strategy that provides the most positive benefits (Martin, Marsh, & Debus, 2001; Norem & Illingworth, 1993; Showers, 1992; Spencer & Norem, 1996), but it has not yet been studied whether interference with one part of their strategy (low expectations) can be fixed by emphasizing the other, and perhaps more important, part of their strategy (reflectivity).

If encouragement by an experimenter disrupts defensive pessimists' strategy because it is inconsistent with their own low expectations (Norem & Cantor, 1986b), then should defensive pessimists be unaffected by someone else agreeing with the low expectations they hold for themselves? The initial work on defensive pessimism was motivated in part by the anomaly of people who could explicitly set low expectations yet still perform well (Norem & Cantor, 1986b). Past research has shown that when low expectations are explicitly, publicly, or verbally stated, an individual's performance is ultimately impaired (Campbell & Fairey, 1985; Dweck & Gilliard, 1975; Sherman, Skov, Hervitz, & Stock, 1981). For example, Sherman et al. had participants think about reasons for positive or negative outcomes, but it was when participants *explicitly* set low expectations for themselves that they performed worse—considering negative possibilities alone was not harmful. However, Norem and Cantor (1986b, p. 1215) also suggest that defensive pessimists may be somewhat aware of how they “trick” themselves into working harder by having pessimistic expectations. If defensive pessimists are aware of this at some level, perhaps the reason they aren't harmed by explicitly setting low expectations is because they privately know they are expecting the worst for their own benefit. They might secretly know they will do well as long as they continue overtly expecting that they won't. On the other hand, if another person agrees with their low expectations, this might undermine the secret security they have. Explicitly setting low expectations for themselves doesn't hurt them because they realize it is part of their strategy, but another person's expectations may seem more realistic because the

defensive pessimists might know they are only tricking themselves with their own expectations. In this case, low expectations that are explicitly set *by an observer* may have the same effect on defensive pessimists that *personally* stating low expectations has on most other people. That is, defensive pessimists do well when they set low expectations for themselves, while non-defensive pessimists do poorly when they have low expectations. It is possible that defensive pessimists may not retain this immunity from low expectations if an observer is the person stating those expectations.

In the present study, defensive pessimists interacted with an experimenter who verbally announced having either high or low expectations for the defensive pessimist. Half of each of these participants were then given the opportunity to reflect before the task so it could be determined if reflectivity restored any imbalance caused by the observer's expectations. When their expectations had been interfered with, perhaps emphasizing the other component of their strategy could cancel these disruptive effects. That is, the reflectivity component of their strategy is believed to be the part that provides the most obvious benefit—negative expectations alone are ineffective—so perhaps defensive pessimists can do well as long as they have plenty of time to reflect. The predictions were as follows:

- 1) Consistent with past research (Norem & Cantor, 1986b), defensive pessimists in the High Expectations condition should perform worse than defensive pessimists in the control condition.
- 2) Reflecting before the task and after hearing the observer's expectations is hypothesized to result in more positive performance than having no opportunity to reflect.

- 3) Reflectivity should “undo” the effect of an observer’s expectations; therefore, defensive pessimists in the High Expectations condition should perform better in the Reflection condition than in the No Reflection condition.

No specific predictions were made as to how the Low Expectations condition would differ from the control group, because it was possible that low expectations could either hurt performance or have no effect.

A control group of strategic optimists was also included in this study to evaluate the reflectivity manipulation. In order to test the hypothesis that reflectivity would undo the negative effect of high expectations, the reflectivity manipulation must be able to improve defensive pessimists’ performance as it has been shown to do in other studies (e.g., Spencer & Norem, 1996). Reflecting is supposed to help defensive pessimists’ perform well while causing strategic optimists to perform worse. Before testing whether reflecting overrides the effect of high expectations on defensive pessimists, the reflectivity manipulation in this study must achieve the same effect on both defensive pessimists and strategic optimists that has been observed by other researchers. Therefore, a control group of strategic optimists who were only exposed to the reflectivity manipulation (there was no manipulation of observer expectancy) was included. The prediction for this group were follows:

- 1) Strategic optimists will perform better on the test when they do not reflect beforehand.

## CHAPTER II

### METHOD

#### *Participants*

A total of 656 undergraduate psychology students at the University of Dayton completed the Revised Defensive Pessimism Questionnaire (Norem, 2001) in a packet of psychological surveys distributed during a mass group testing session, for which the students received course research credit. Students who were classified as defensive pessimists (DPs) or strategic optimists (SOs), based on their scores on the measure described below, were contacted to participate in the experiment. This led to a total of 60 DPs and 36 SOs who participated in the experiment. Of this total, 80% of the defensive pessimists and 55% of the strategic optimists were female. Prior research on defensive pessimists' and strategic optimists' behavior has consistently found no gender differences (Sanna, 1996), so the disproportionate number of females is not a concern.

#### *Measures*

*The Revised Defensive Pessimism Questionnaire.* The Revised Defensive Pessimism Questionnaire (R-DPQ; Norem, 2001; see Appendix A) measures the two components of defensive pessimism: defensive expectations and reflectivity. The instructions for the questionnaire can be adapted for use in different domains, and academics was the domain of interest in this study. The questionnaire instructed participants to "think about how you prepare for and think about academic situations" when answering the questions designed to measure

pessimistic expectations and reflectivity. In the version of the scale used in this study, participants were asked to rate on a scale of 1 (*not at all true of me*) to 5 (*very true of me*) how true the items were of them in academic situations.

The overall defensive pessimism score was calculated by summing the four pessimistic expectations items and eight reflectivity items. Previous research has defined defensive pessimists as those whose scores fall in the upper third of the distribution, while strategic optimists are those with scores in the lower third (Norem, 2001). However, the upper fourth and lower fourth of the distribution were used in this study in hopes that the stricter criteria would mean that the students who fit the criteria would truly be DPs and SOs instead of simply having a tendency towards a particular strategy.

A thirteenth item on the R-DPQ asks students the veracity of the statement, “I’ve generally done pretty well in academic situations in the past.” In previous research, only students who answer at least a 4 (on a 5-point scale, with 5 representing “*very true of me*”) or who meet a minimum GPA are classified as DPs or SOs in order to separate them from realistic pessimists and illusory optimists. For this purpose, participants were also asked to select the range that their college GPA (or high school if it was their first semester) fell under: (a) 3.5 and above; (b) 3.0-3.49; (c) 2.5-2.99; (d) 2.0-2.49; (e) 1.99 and below. Only students with a GPA of 3.0 or higher could be classified as DPs or SOs. It was also necessary that participants had high GPAs so the experimenter’s encouragement in the High Expectancy condition would be appropriate.

Past research (Norem, 2001) has demonstrated that the R-DPQ has a high reliability, Cronbach’s  $\alpha = .78$ , with an average reliability of .74 for the separate Reflectivity and Pessimism subscales. Defensive pessimism is a domain-specific strategy, and the scale has been used to classify defensive pessimists in other areas by changing the wording of the instructions

from “academic” to “social,” “recreational,” or another appropriate domain (Showers, 1988, 1992; Spencer, 1993; Spencer & Norem, 1996). Academic defensive pessimism was selected for this study due to the nature of the experimental task, the centrality of academics in college students’ lives, and the strong empirical support for the use of defensive pessimism, strategic optimism, and self-handicapping as strategies in academic environments (Martin, Marsh, and Debus, 2001a; Martin, Marsh, Williamson, and Debus, 2003).

### *Selection of Defensive Pessimists and Strategic Optimists*

Separate mass testing sessions (during which the R-DPQ was administered) were held in the Fall and Winter semesters, but the cut-off points for the upper fourth and lower fourth of the distribution were identical both semesters. Participants’ R-DPQ scores ranged from 13 to 57, with 42 and above as the upper quartile and 33 and below as the bottom quartile for both semesters. Therefore, students were classified as DPs if their R-DPQ score was 42 or above, they rated an agreement of 4 or 5 to the statement, “I’ve generally done pretty well in academic situations in the past,” and they reported having a GPA of 3.0 or higher. Students were classified as SOs if their R-DPQ score was 33 or below, they responded 4 or 5 to the past success statement, and they also had a GPA of 3.0 or higher.

### *Procedure*

Students who fit the criteria for defensive pessimism or strategic optimism were contacted and invited to participate in the individual experimental sessions. The experimenter began by having the participant read and sign a paper indicating his or her informed consent. Next the participant completed a background questionnaire about his or her year in college,

academic major, and high school or college GPA. Except for this background questionnaire (which was on a slip of paper), a computer was used for participants to respond to survey items, to type out their thoughts if they were in the reflectivity condition, and to take the actual test. The experimenter told all participants the same initial description of the experiment:

“The research we’re doing today is about test-taking strategies and how they relate to actual performance. We’re also interested in how you feel about your own strategies, so you’ll be answering some personal questions before and after you take the test. The test you’ll be taking used to be one of three sections in a standardized test called the Graduate Record Examination, or the GRE for short. This test is normally used to evaluate students who are about to graduate from college with their Bachelor’s degree and are applying to other universities to get a higher degree. As I’m sure you remember, the SATs were an important part of your college application and schools put a lot of emphasis on them. The GRE is just like the SATs in that it’s a standardized test students take when they’re applying to universities. However, the SATs are used for people going from high school to college, while the GRE is for students who are finishing their first 4 years of college and are applying to graduate schools. The test you’ll be taking today is from an old GRE exam, and your score on this test would be a good indicator of how well you’d do on the GRE.”

Next, the experimenter handed the participant a piece of paper with a practice problem on it (see Appendix B) and said, “I have a sample problem that I’d like you to read through so you have an idea of what the test will be like. Don’t attempt to solve it, just read through it for now.”

*Observer-expectancy manipulation.* There were three expectancy conditions: High Expectancy, Low Expectancy, and Control Expectancy. The High Expectancy condition was designed to be analogous to the Encouragement condition by Norem and Cantor (1986b). As the participant handed the practice problem back to the experimenter, the experimenter in the High Expectancy condition said, “The problem you just read probably seems a little hard... But, based



on your GPA, you should feel pretty confident about the test. I'm sure you'll do just fine, and probably even score on the high side."

In the Low Expectancy condition, the experimenter said, "The problem you just read probably seems a little hard. The test is pretty hard, and most people don't take it until their senior year in college. Since you're still in your X year, I think the test will probably seem difficult to you and your score might be a bit lower than that of most of the people who take it." The majority of participants were in their first (66.7%), second (25%), or third (3.1%) year. However, if the participant happened to be a senior (5.2%), the statement of Low Expectations was changed to, "The test is pretty hard, and most people begin studying an average of two or three months before they take the test. Since you haven't had any practice with these types of problems before, I think the test will probably seem difficult to you and your score might be a bit lower than that of most of the people who take it."

In the control group, the experimenter was silent as the participant returned the practice problem. After the expectancy manipulations, the experimenter gave the participant scratch paper to use during the test.

*Reflectivity manipulation.* In the No Reflection condition, participants went straight to the pretest questions by clicking a "Continue" button on the computer. In the Reflection condition, participants were told to spend five minutes typing out all of their thoughts about the test before taking the test. The experimenter elaborated, "For example, consider: How might you feel as you're taking the test? What do you think will happen during the test? How would you feel if you did poorly? And what is the worst possible outcome?" The experimenter explained that the computer would automatically submit their responses after five minutes, and then they would be asked a few general questions (the pretest measures) about how they were feeling. Following the

pretest questions, all participants (both Reflection and No Reflection) were told that before they clicked a continue button that would start the test, they were supposed to press down on an intercom button inside of the room (this was the signal to the experimenter—who was waiting in another room connected to the intercom—to start the 25-minute timer for the test).

The instructions in the Reflection condition were similar to the thought-listing questionnaire used by Norem and Illingworth (1993). Spencer and Norem (1996) found that both reflection and a negative valence to the reflection were important for DPs to perform well, so the instructions were somewhat negative in focus. Participants typed their thoughts directly into a box on the computer screen, with these instructions above the box:

For the next five minutes, please type out all your thoughts about the test you are about to take. For example, consider: *How might you feel as you're taking the test? What do you think will happen during the test? How would you feel if you did poorly? What is the worst possible outcome?*

(Don't worry about grammar or using complete sentences, but focus on the content of your thoughts.)

A sentence below the box reminded participants that their responses would be submitted automatically after 5 minutes.

*Pretest measures.* Before taking the test, all participants were asked to select a point on each of three 7-point scales to indicate how they were currently feeling: “How anxious do you feel about the upcoming test?” (1 *Not at all anxious* to 7 *Very anxious*), “How well do you expect to do on the test?” (1 *Poorly* to 7 *Very well*), and “How much control do you feel you have over the outcome of the test?” (1 *No control at all* to 7 *Complete control*).

*Performance measure.* The test consisted of 25 questions from the analytic section of a GRE practice test published by the Princeton Review (2001; see Appendix C). Analytical

questions were chosen instead of verbal or math questions to avoid extreme scores caused by students with very high or very low vocabularies or math abilities. In addition, differences in students' performance on difficult verbal or math questions would probably be a function of ability more than state anxiety, whereas the analytical games require concentration and close attention to details. Anxiety is believed to impair performance because it takes attention away from the task (Norem & Cantor, 1986b), so there should be more room for variability in participants' performance on these types of questions if their personality/strategy type is presumed to cause some students to feel more anxious after certain experimental manipulations. Other experiments have used anagram tasks (Norem & Cantor, 1986a, 1986b; Sanna, 1996, 1998), tracing tasks (Norem & Cantor, 1986b), and arithmetic problems (Norem & Illingworth, 1993) as performance measures when studying academic defensive pessimism. These analytical questions from the GRE were chosen because they seem more relevant to academia and performance on them should be equally affected by anxiety.

The instructions above the test read, "Please select the best answer for each question. You may use scratch paper to help you solve the problem. Your answers will be submitted automatically after 25 minutes." When 25 minutes had passed, the experimenter came into the room and clicked a button on the computer to submit the test and open the posttest questions. The experimenter instructed participants to complete these questions and then to open the door to the hallway (where the experimenter would be waiting) when they were done.

*Posttest measures.* Participants were asked to indicate their answers to the following questions on 7-point scales: (1) How anxious were you while you were taking the test? (1 *Not at all anxious* to 7 *Very anxious*); (2) How relaxed were you during the test? (1 *Very relaxed* to 7 *Very tense*); (3) How often did you find yourself thinking about how difficult the test was while

you were taking the test? (1 *Never* to 7 *Very often*); (4) How often did you find yourself thinking about how well you were doing while you were taking the test? (1 *Never* to 7 *Very often*); (5) How often did you find yourself thinking about what your score would be while you were taking the test? (1 *Never* to 7 *Very often*); (6) How often did you think about things unrelated to the test while you were taking it? (1 *Never* to 7 *Very often*); (7) How satisfied are you with how much preparation you had before the test? (1 *Not at all satisfied* to 7 *Very satisfied*.)

After participants submitted their responses and opened the door, they were given a debriefing paper that described the purpose of the experiment in detail, explained the expectancy and reflectivity manipulations, and assured them of the confidentiality of their data. The experimenter made sure every participant's questions were answered, and then casually asked each participant at the end of the study if one of the two strategies described in the debriefing form (defensive pessimism or strategic optimism) seemed to describe the participant more than the other strategy. The experimenter made a note of the participant's response. All participants were then thanked and given research credit.

## CHAPTER III

### RESULTS

The data of three DPs and one SO were deleted from all analyses. The experimenter forgot to give scratch paper to two of the DPs, which may have reduced their scores on the test. The third DP whose data was deleted was not a native English speaker and thus was at an unfair disadvantage with the wordy analytical problems, as suggested by her score of 0% correct. One SO's data was deleted because there was a computer malfunction and she typed her thoughts for nine minutes instead of five. This led to a total of 57 DPs ( $N$  was 10 for all conditions, except for 8 in High Expectancy-Reflection and 9 in Low Expectancy-Reflection) and 35 SOs (17 in the Reflection condition and 18 in the No Reflection condition).

#### *Manipulation Check: Strategy Classification*

A one-way ANOVA of strategy type (DP or SO) on participants' responses to the question "How well do you expect to do on the test?" was not significant. However, this could be because DPs' expectations were influenced by which expectancy condition they were in. A one-way ANOVA of expectancy condition on DPs' pretest expectations found this effect to be only marginally significant  $F(2, 54) = 2.62, p = .082$  (High Expectancy  $M = 3.83, SD = 0.92$ ; Low Expectancy  $M = 3.05, SD = 0.97$ ; Control  $M = 3.40, SD = 1.19$ ).

Although DPs, on average, did not report significantly lower expectations than SOs, the content of participants' reflections suggests that the classification of students as DPs or SOs was successful. Each statement written by participants in the Reflection condition was categorized

based on its content (e.g., negative thought, positive thought, random thought, etc.). The method used to code the reflections will be described in more detail later. Of the total number of statements written, a greater percentage of DPs' statements were negative ( $M = 42.92$ ,  $SD = 22.22$ ), compared to the percentage of negative statements by SOs ( $M = 25.05$ ,  $SD = 24.76$ ). This difference is statistically significant,  $F(1, 42) = 6.18$ ,  $p = .017$ . Because statements could be positive, negative, neutral, random/unrelated, etc., the percentage of positive statements out of the total number of statements is not simply the remainder when the percentage of negative statements is subtracted from 100. Therefore, a one-way ANOVA of strategy type on the percentage of positive statements was also performed. SOs had a higher proportion of positive statements in their reflections ( $M = 41.56$ ,  $SD = 24.01$ ) than DPs did ( $M = 23.68$ ,  $SD = 17.18$ ), and this was also significant,  $F(1, 42) = 8.29$ ,  $p = .006$ .

Considering that DPs are supposed to reflect negatively before evaluative situations while SOs are not (Norem, 2001), these results suggest that the classification of participants as DPs or SOs was successful. Most of the subsequent analyses were conducted separately for DPs and SOs because they were subject to a different set of independent variables (both expectancy and reflectivity for DPs, only reflectivity for SOs). However, attention will be given first to an analysis involving both strategy types and the reflectivity manipulation, because this manipulation was consistent across both groups.

### *The Interaction of Strategy Type and Reflectivity on Test Performance*

Past research has shown that DPs benefit from reflecting beforehand while SOs perform worse under this condition. To test this, a  $2 \times 2$  ANOVA of strategy type by reflectivity condition on the percentage of correct answers was conducted. Only DPs in the Control

Expectancy condition were included in this analysis because all SOs were in the Control Expectancy condition. There was no main effect of strategy type on percentage correct,  $F(1, 51) = .007, p = .932$ , meaning DPs and SOs performed equally well on the test. There was also no effect of reflectivity condition on percentage correct,  $F(1, 51) = .004, p = .951$ . The main interest, however, was the interaction between strategy type and reflectivity condition, because it was expected that the effect of reflectivity would depend on participants' strategy type. The interaction was not significant,  $F(1, 51) = 1.883, p = .176$ . Although the interaction did not reach significance, the means were actually opposite of the direction predicted: DPs performed better in the No Reflection condition ( $M = 68.11, SD = 24.70$ ) than in the Reflection condition ( $M = 59.04, SD = 22.55$ ), while SOs did better under Reflection ( $M = 68.26, SD = 22.49$ ) than No Reflection ( $M = 59.98, SD = 21.42$ ). This peculiar finding is illustrated in Figure 1.

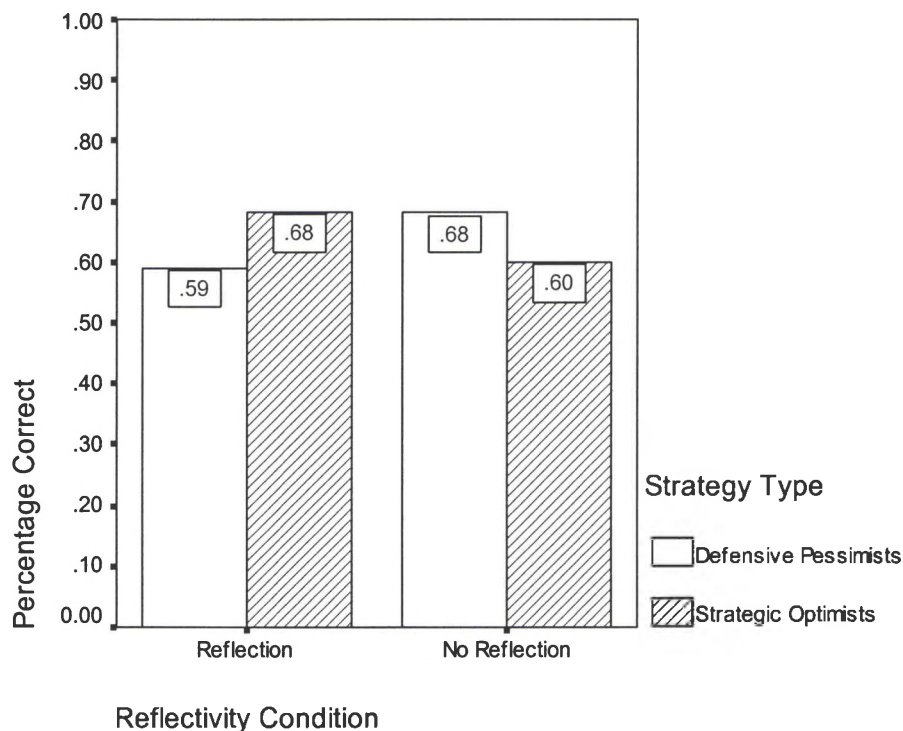


Figure 1: The average percentage of correct answers on the test by strategy type and reflectivity condition.

*Main Analysis: Reflectivity and Expectancy on Test Performance*

The main analysis was a  $3 \times 2$  ANOVA of observer expectations (High, Low, Control), reflectivity (Reflection, No Reflection), and their interaction on DPs' percentage of correct answers on the test. The following simple comparisons were planned: Between the Low Expectancy group and the Control Expectancy group in the No Reflection condition (because the effect of an observer stating low expectations for a DP's performance is an unexplored question; the No Reflection condition was chosen because it can be considered the control group of the reflectivity manipulation), between High Expectancy and Control Expectancy in the No Reflection condition (to see if Norem and Cantor's 1986b effect was replicated), and between Reflection and No Reflection in the High Expectancy condition (to test the hypothesis that reflection can undo the negative effect of high expectations).

Table 1

*Defensive Pessimists' Mean Percentage of Correct Answers by Expectancy and Reflectivity Condition*

Reflectivity	Expectancy		
	High	Low	Control
Reflection	67.7 (16.67)	61.66 (20.42)	59.04 (22.55)
No Reflection	63.61 (16.16)	73.14 (15.06)	68.11 (24.70)

*Note.* Numbers in parentheses are standard deviations.



The means and standard deviations of the percentage of correct answers by reflectivity and expectancy condition are presented in Table 1. The  $3 \times 2$  ANOVA found that there was no main effect of reflectivity,  $F(1, 51) = 1.10, p = .299$ , nor expectancy,  $F(2, 51) = 0.19, p = .832$ . The interaction of reflectivity and expectancy was also not significant,  $F(2, 51) = 0.83, p = .443$ . A graph of percentage correct by condition can be seen in Figure 2.

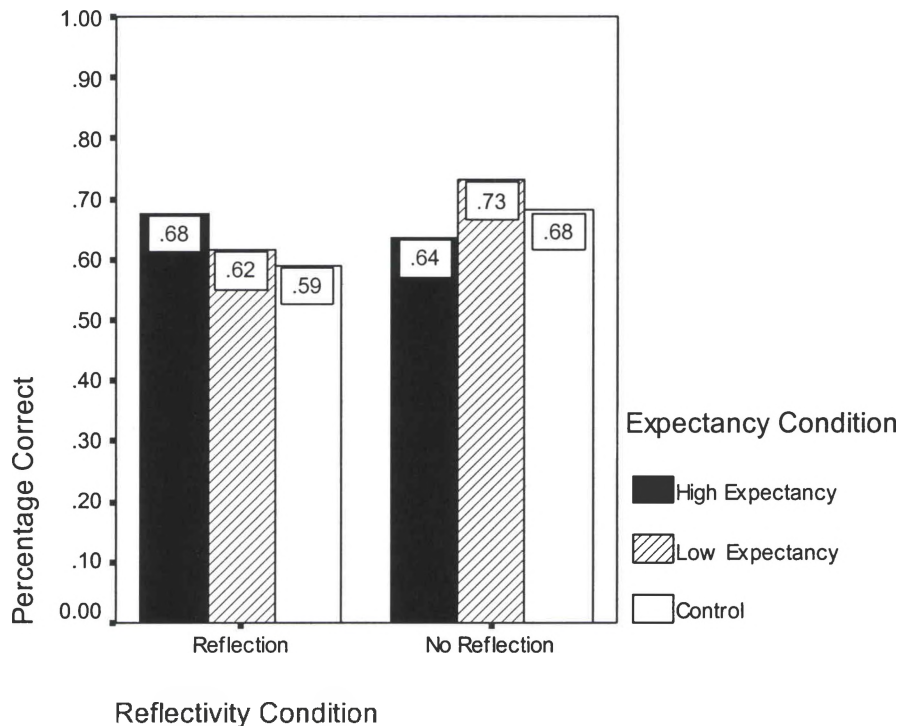


Figure 2: Defensive pessimists’ average percentage of correct answers by reflectivity and expectancy conditions.

Although the main analysis was not significant, the planned comparisons were still performed to test the hypotheses.

- 1) It was expected that DPs in the High Expectations condition would perform worse than DPs in the control condition. In the No Reflection (reflectivity control) condition, defensive pessimists exposed to high expectations did worse ( $M = 63.61, SD = 16.16$ ) than the control

group ( $M = 68.11$ ,  $SD = 24.70$ ), consistent with Norem and Cantor's (1986b) original finding. However, the planned comparison between these two groups found that this difference was not significant,  $F(1, 51) = 0.26$ ,  $p = .611$ . Therefore, the effect found by Norem and Cantor (1986b) was not replicated.

2) It was hypothesized that DPs would perform better when they reflected before the test. As revealed by the main analysis (described previously), there was no main effect of reflectivity condition on DPs' performance,  $F(1, 51) = 1.10$ ,  $p = .299$ .

3) Because it was thought that reflecting would "undo" the negative effect of an observer's high expectations (although this negative effect was actually not found, as shown by the test of the first hypothesis), DPs in the High Expectancy-Reflection condition were expected to perform better than DPs in the High Expectancy-No Reflection condition. Because it was hypothesized that reflection would improve defensive pessimists' performance after high expectations, this should also mean that their performance would become equal to that of the Control Expectancy group. Although the effect of high expectations hindering performance was not replicated, the analyses were continued with the planned comparison of the Reflection and No Reflection conditions under High Expectancy. While performance after high expectations was better in the reflection condition (Reflection  $M = 67.70$ ,  $SD = 16.67$ ; No Reflection  $M = 63.61$ ,  $SD = 16.15$ ), this difference was not significant,  $F(1, 51) = 0.19$ ,  $p = .663$ . Along these same lines, it was predicted that High Expectancy-No Reflection would reduce performance compared to Control-No Reflection, and that reflecting after high expectations would raise DPs' scores enough to be comparable to those in the Control-No Reflection condition. While the reduction in performance under High Expectancy-No Reflection did not reach statistical

significance, it is of interest to note that the average High Expectancy-Reflection score ( $M = 67.70$ ) is nearly identical to the average Control-No Reflection score ( $M = 68.11$ ).

4) No specific predictions were made as to how the Low Expectations condition would differ from the control group, so this analysis was exploratory. In the No Reflection condition, the percentage of correct answers in the Low Expectancy condition was not significantly different from the Control condition,  $F(1, 51) = 0.33, p = .570$ . On average, however, participants did better in the Low Expectancy condition than the Control condition (see Table 1).

#### *Linear Regression to Predict Percentage Correct*

Because the manipulations could not explain defensive pessimists' performance on the test, a stepwise linear regression was conducted to see if any of the three pretest measures, the seven posttest measures, gender, or GPA could predict the percentage of correct answers. Responses to two of the posttest questions entered the prediction equation: "How often did you find yourself thinking about how difficult the test was while you were taking the test?" entered first (at step one,  $F(1, 52) = 15.49, B = -.064, \beta = -.479, p < .01$ ) and "How often did you find yourself thinking about how well you were doing while you were taking the test?" entered second (at step two,  $F(2, 52) = 12.64, B = .044, \beta = .363, p < .01$ ). Therefore, this suggests that defensive pessimists did worse when they also thought more about how difficult the test was as they were actually taking the test, while doing better was related to thinking more about how well they were doing while they were taking the test.

These posttest questions were intended to measure how often participants had intrusive thoughts that may have disrupted their concentration during the test. However, given that the relationships between these two questions and percentage correct are in different directions, a

more likely explanation is that doing worse was related to thinking more about the difficulty of the test because the test truly was more difficult for these people (and thus their scores were lower). Likewise, it makes sense that the DPs who did better thought more about how well they were doing because they actually were doing well, and they could sense this during the test (e.g., during the test they may have thought, “These problems are easy and I’m doing great on them!”).

### *Strategic Optimists*

#### *Main Analysis: Reflectivity on Test Performance*

A one-way ANOVA of reflectivity condition (Reflection, No Reflection) on strategic optimists’ percentage of correct answers was not significant,  $F(1, 33) = 1.25, p = .272$ . (Means are displayed in Table 2.) Interestingly, although the difference was not significant, the means were opposite of the direction predicted: SOs actually performed better when they reflected before the test. This is contrary to past research that has shown a decrease in SOs’ performance after reflection (Norem & Illingworth, 1993; Sanna, 1998; Showers, 1992; Spencer & Norem, 1996).

Table 2

#### *Strategic Optimists’ Mean Percentage of Correct Answers by Reflectivity Condition*

	Reflection	No Reflection
Mean	68.26	59.98
Standard Deviation	22.49	21.42

*Note.* Numbers in parentheses are standard deviations.

A one-way ANOVAs of reflectivity condition on SOs' responses to the pretest and posttest measures was also performed. Their responses to three questions were significantly different between the reflectivity conditions: "How often did you find yourself thinking about how difficult the test was while you were taking the test?" (Reflection  $M = 3.47$ ,  $SD = 1.91$ ; No Reflection  $M = 4.78$ ,  $SD = 1.48$ ;  $F(1, 33) = 5.17$ ,  $p = .030$ ), "How often did you find yourself thinking about how well you were doing while you were taking the test?" (Reflection  $M = 3.00$ ,  $SD = 1.41$ ; No Reflection  $M = 4.11$ ,  $SD = 1.57$ ;  $F(1, 33) = 4.83$ ,  $p = .035$ ), and "How often did you think about what your score would be while you were taking the test?" (Reflection  $M = 2.88$ ,  $SD = 1.41$ ; No Reflection  $M = 3.89$ ,  $SD = 1.32$ ;  $F(1, 33) = 4.75$ ,  $p = .037$ ). In other words, when SOs wrote about their thoughts before the test, they thought less about their performance when they were actually taking the test.

#### *Linear Regression to Predict Percentage Correct*

As with the DPs, a stepwise linear regression was conducted to see if any of the three pretest measures, the seven posttest measures, gender, or GPA could predict the percentage of correct answers among SOs. The only variable that entered was, "How often did you find yourself thinking about how difficult the test was while you were taking the test?" ( $F(1, 33) = 4.25$ ,  $B = -.041$ ,  $\beta = -.338$ ,  $p = .047$ ). Similar to the DPs, SOs who thought more about the difficulty of the test during the test were also more likely to have done poorly on the test. However, it is interesting to note that SOs' responses to this same question were also affected by which reflection condition they were in (see previous section). SOs who reflected beforehand thought less about the difficulty of the test during the test, and thinking less about the difficulty of the test was related to scoring higher. Yet the main analysis found no direct effect of

reflectivity on performance (although performance was higher in the reflection condition, this effect was not statistically significant).

Despite the fact that the ANOVA of reflectivity condition on performance was not significant, it remains possible that the reflectivity manipulation might have contributed in some way to the change in performance caused by frequent thoughts about the difficulty of the test. To test this, the reflectivity condition was entered in the first block of a linear regression to remove any effect of reflection, followed by the “thoughts about the difficulty of the test” variable (i.e., responses to “How often did you find yourself thinking about how difficult the test was while you were taking the test?”) in the second block. If the effect of these thoughts on percentage correct became non-significant after removing the effect of reflection, then it’s possible that the reflectivity manipulation is connected to test performance in some way. Indeed, this is what happened: When the effect of reflectivity condition was removed by entering it in the first step, the “thoughts about the difficulty of the test” variable was no longer significant when entered on the second step,  $F\Delta(1, 32) = 3.01$ ,  $B = -.038$ ,  $\beta = -.309$ ,  $p = .093$ .

### *Analysis of Reflections*

Since reflectivity did not have a significant effect on the performance of either DPs or SOs, it’s possible that the reflectivity manipulation itself was unsuccessful. The instructions in the reflectivity manipulation were intended to lead all participants to think about negative possibilities before the test, which is supposed to help defensive pessimists and hurt strategic optimists (Spencer & Norem, 1996). However, it’s possible that not all participants in the Reflection condition were having negative thoughts. Therefore, participants’ reflections were

coded by categorizing each statement into a specific category, and then it was analyzed how the types of statements affected performance.

The content of participants' reflections was analyzed by counting the occurrence of seven types of statements: (1) Negative feelings (statements about a negative emotion participants were currently feeling or anticipated they would feel during the test), (2) positive feelings (statements about a positive feeling—or absence of a negative feeling—participants were currently experiencing or anticipated feeling), (3) negative thoughts (any negatively-charged thought about the test, the participants' expected performance, or the participants' performance in the past; this includes thoughts about the test being difficult, and if they think they would feel bad if they failed), (4) positive thoughts (any positive statement about the test or the participants' performance; this includes expecting to do well, thinking the test would be easy, or wondering if they could gain personal insight about their test-taking strategies during the experiment); (5) "doesn't matter" thoughts (includes anything suggesting that the test did not matter to them, such as because it wouldn't affect their grades or because they weren't seniors yet; this also includes statements about how they wouldn't care if they did poorly), (6) hope/effort (any statements about hoping to do well or trying one's best). Most statements were sentences, but in the event that one sentence contained two distinct types of statements, each statement was counted (e.g., "I would not feel too bad if I did poorly but it would not make me happy," would count as one "doesn't matter" statement and one negative thought statement).

Examples of each type of statement, taken directly from participants' actual reflections, can be found in Appendix D. The percentage of negative statements (negative feelings plus negative thoughts, divided by the total number of statements) were computed, as well as the percentage of positive statements (positive feelings plus positive thoughts, divided by the total

number of statements). Because participants may have written a large number of neutral or random statements, these percentages are not the complement of each other and it is important to look at them separately. For example, writing five negative statements and five neutral statements would lead to a 50% negative statements score and a 0% positive statements score, while writing five negative statements and five positive statements would lead to a 50% for both the negative and positive statements scores.

As mentioned during the manipulation check, DPs and SOs significantly differed in terms of their percentages of negative and positive statements. DPs wrote a higher percentage of negative statements ( $F(1, 42) = 6.18, p = .017$ ), while SOs wrote a higher percentage of positive statements ( $F(1, 42) = 8.29, p = .006$ ). This is consistent with the behavior expected from DPs and SOs: Only DPs' reflections should be characterized by a large number of negative thoughts.

For DPs, multiple one-way ANOVAs of the effect of expectancy condition on the six individual types of statements, the percentage of negative statements, the percentage of positive statements, as well as the total reflection length (number of words) were conducted. The expectancy conditions did not significantly predict any of these characteristics of DPs' reflections.

A stepwise linear regression of the effect of all of the characteristics of participants' reflections (the six types of statements, percentage of negative statements, percentage of positive statements, and number of words) on percentage correct was also performed. For DPs, none of the characteristics entered the regression as significant predictors of their test performance. For SOs, number of words was the only variable to enter the regression equation,  $F(1, 15) = 7.23, B = .003, \beta = .570, p = .017$ . The more SOs' reflected (or rather, the longer their reflections), the better they did on the test.



## CHAPTER IV

### DISCUSSION

#### *Observer Expectations and Defensive Pessimists' Performance*

Norem and Cantor's (1986b) finding that encouragement or high expectations from an observer disrupts defensive pessimists' performance was not replicated. The results were in the right direction, but they did not reach statistical significance. This finding might be due to sample size, which was limited due to time constraints and availability of participants.

For defensive pessimists, the effect of an observer's low expectations is an issue that has not been explored until now. There seemed to be a tendency for low expectations to improve performance relative to the control (see Figure 2); however, this tendency did not even approach statistical significance. If low expectations truly do improve performance, it could be because they relieve defensive pessimists from some of the pressure to perform well. This has many potential implications, so it is suggested that further research is done with larger samples and a more sensitive performance measure to see if low expectations can significantly differ from controls.

#### *The Effect of Reflectivity: Defensive Pessimists versus Strategic Optimists*

The common effect of reflection improving defensive pessimists' performance and impairing strategic optimists' performance was also not replicated. When comparing the effect of reflectivity on Control Expectancy defensive pessimists to its effect on all strategic optimists, the

results were actually found to be in the opposite direction predicted (see Figure 1), although this interaction was not statistically significant. In fact, the means were in the opposite direction for defensive pessimists in both the Low Expectancy and Control Expectancy conditions. Only in the High Expectancy condition did defensive pessimists' scores improve in the Reflection condition, which was predicted (although the improvement was not significant). The results could be dismissed as chance findings, but the fact that reflection tended to decrease defensive pessimists' performance in two of the three conditions raises eyebrows. If the sample size had been larger and the performance measure more sensitive, it's possible that these results could have reached significance. It would be worthwhile to continue exploring the interaction between expectations and reflectivity among defensive pessimists, because it may be that the effect of reflectivity is qualified by an observer's expectations.

Norem and Illingworth (1993) were the first to propose that strategic optimists must avoid thinking about a task beforehand in order to do well. The research on this subject has been mixed: Spencer and Norem (1996) found that strategic optimists performed better in distraction (no reflection) conditions, while Norem and Illingworth (1993, Study 1) found differences in strategic optimists' performance but these differences did not reach statistical significance. Sanna's (1998, Study 3) research on the prefactual thoughts of defensive pessimists and strategic optimists demonstrated that when strategic optimists are free to write about their thoughts as they naturally occur, they will choose to engage in very little prefactual thinking at all (i.e., they will choose not to reflect), compared to defensive pessimists. However, this particular study by Sanna focused on how much prefactual thinking they engaged in spontaneously (i.e., when they were free to write out their thoughts, as opposed to answering a questionnaire about their thoughts), so

there was no comparison of strategic optimists' actual test performance under reflection and no reflection conditions.

In contrast to the studies that found a difference (e.g., Spencer & Norem, 1996), this study found that strategic optimists actually performed *better* when they had reflected beforehand. This tendency was large, but it was not statistically significant. There is certainly a need for more research that directly examines the effect of strategic optimists' reflections (or lack thereof) on their performance to test the theory that strategic optimists benefit by *not* reflecting. It may be that the type of reflection will determine whether strategic optimists are better off without that reflection. For example, methods such as having them listen to imagery tapes that have been preprogrammed by a researcher to be negative, positive, or distracting (e.g., Spencer & Norem, 1996) or forcing them to consider negative or positive possibilities by rating the likelihood of specific scenarios in a questionnaire (e.g., Showers, 1992, Study 2) may affect strategic optimists differently than simply having them list their thoughts (e.g., Norem & Illingworth, 1993, Study 1, and my study).

In contrast to Sanna's (1998, Study 3) results, this study found no differences between the actual length of defensive pessimists' and strategic optimists' reflections. However, these participants wrote for five minutes while Sanna's participants were told that it would take them 10 to 15 minutes to write about their performance. Therefore, the short time limit may have resulted in a ceiling effect so all participants, regardless of strategy type, reflected equally in the five minutes. While there were no differences between defensive pessimists' and strategic optimists' reflection length, a greater proportion of defensive pessimists' thoughts were negative while strategic optimists had more positive thoughts. However, the valence of defensive pessimists' and strategic optimists' thoughts was unrelated to their actual performance. For

defensive pessimists, the reflection condition affected none of the dependent measures and the content of their reflections was not related to their performance in any way. There was a slight tendency for defensive pessimists in the Low Expectancy and Control Expectancy conditions to perform better when they did *not* reflect, but this was not statistically significant. If it was significant, it would raise a very interesting question because it contradicts previous findings that reflection improves defensive pessimists' performance.

For strategic optimists, on the other hand, the reflection condition led them to think less about the difficulty of the test while they were taking it, and thoughts about the difficulty of the test were related to their actual performance. The reflection condition was able to *improve* strategic optimists' scores if it caused them to have fewer intrusive thoughts during the test. Reflection may have improved strategic optimists' performance in this study because the test might have been more difficult than they expected, and reflecting before the test forced strategic optimists to confront the possibility that the test could be difficult. Strategic optimists who did not reflect beforehand may have performed worse because the unexpected difficulty of the test may have disrupted their focus and composure.

In addition, the length of strategic optimists' reflections (number of words) entered the regression to significantly predict their test scores, while no other characteristics of defensive pessimists' or strategic optimists' reflections were related to their performance. Considering that strategic optimists' performance was slightly higher in the Reflection condition, this is further evidence that reflecting somehow improved strategic optimists' performance in this study. Because none of the specific types of reflection statements entered the prediction equation, they cannot explain the mechanism by which reflection improves strategic optimists' performance. It seems that the strategic optimists who took advantage of the reflection task by writing longer

reflections scored higher. The best explanation for why reflection improved strategic optimists' performance in this study relates back to the frequency of intrusive thoughts about the difficulty of the test. For some strategic optimists, reflecting caused them to think less about the difficulty of the test as they were taking it, which subsequently helped them score higher. It is important to note that this only happened for *some* strategic optimists (the ones for whom reflecting helped them have fewer thoughts about the difficulty of the test), because there was no overall main effect of Reflectivity on performance.

Although causality cannot be established, one possible explanation is that it is the *intrusiveness* of these thoughts about the difficulty of the test that disrupted strategic optimists' performance. On the other hand, it might be that these people are already doing poorly because the test is too difficult for them, and they realize this and think about it. The effect might also be cyclical: These people are having difficulty answering the problems, which makes them think, "This test is difficult!" and once they begin thinking about how difficult it is, they start to lose their concentration on the test, which causes them to do even worse as a result. The specific mechanisms by which reflection affects strategic optimists' performance is also worthy of further study.

It is important to stress that there was no significant effect of reflection improving defensive pessimists' performance, despite the general acceptance of this theory (Norem, 2001) and other research supporting it (e.g., Norem & Illingworth, 1993; Spencer & Norem, 1996). If the theory is still correct, there are a few possible explanations for why these results are inconsistent with it. While the sample size was small, a more important factor may have been the adequacy of the manipulations. The selection of defensive pessimists and strategic optimists appears to be valid, considering that participants' reflections were more positive if they were

strategic optimists and more negative if they were defensive pessimists. Participants were asked during the debriefing if they felt defensive pessimism or strategic optimism described them better, and the vast majority of participants chose the strategy type they had already been classified as. Therefore, the real problem might be the specific methods used.

First, it is possible that the description of the GRE at the beginning of the experiment did not lead participants to care about how they would do on the test. If the participants already had a grudge against standardized testing or considered these tests a poor measure of intelligence, they might have stopped caring about how they would do as soon as the GRE was described as a standardized test. It is also possible that they discounted its importance by considering it “just part of psychology experiment” and realizing that their score on the test would not affect them in any way. Describing the test as a measure of analytical abilities or general intelligence may have produced a greater desire to perform well and led to significant performance differences as a result. On the other hand, if participants did care about how well they would do, another possibility is that the test itself was inappropriate for this study. The analytical test was chosen instead of a verbal or mathematical test because it was believed that the nature of these problems—which require slow, careful reading and a step-by-step approach—would make performance on them more likely to be disrupted by anxiety. On the other hand, greater variability is expected in performance on verbal or mathematical problems, which would hide any effect of anxiety. Perhaps analytical problems are predicted by ability just as much as verbal and mathematical problems, which could explain why there were no significant differences in performance among my conditions. One piece of support for this explanation is that defensive pessimists’ year in college was significantly correlated with their scores on the analytical test,  $r = .419, p = .001$  (GPA was not,  $r = -.065, p = .632$ ). Therefore, perhaps the expectancy and

reflectivity manipulations might have produced significant performance differences if the test had been more sensitive to differences in current feelings instead of ability or education (e.g., people who have a large vocabulary are going to score higher on a verbal test than people with a smaller vocabulary, even if the people with the large vocabulary are feeling more anxious at the moment). This is the most likely explanation for the lack of significant results. Unfortunately, the sample was also very small (8-10 defensive pessimists per condition) due to time constraints, so any effect of the manipulations may have been concealed by the large variability among participants' test scores that is typically found on academic tests. Norem and Cantor (1986b) used a tracing-puzzle task in their experiment and they found significant performance differences after high expectations. Ability is likely to play less of a role in tracing tasks than in verbal, mathematical, or analytical tasks. Norem and Illingworth (1993, Study 1) also found significant differences in performance on mental arithmetic problems after reflection, and these types of problems—while still likely to be predicted by math ability—are more likely to be affected by current anxiety because people will have difficulty holding numbers in their head if they are feeling anxious or worrying about their performance. Similarly, Spencer and Norem (1996) used a dart-throwing task, which requires attention, concentration, and keeping one's body still. Performance on this type of task could easily be disrupted by anxiety induced by reflecting beforehand, and their results suggest that this is what happened. Therefore, it is suggested that future research employs performance measures that are mostly affected by anxiety, concentration, and working memory so personal ability does not produce too much individual variability in the results.

Another possible methodological weakness could have been the reflectivity manipulation. Spencer and Norem (1996) found an effect of reflection when using guided imagery tapes with a

positive or negative valence, while others (e.g., Norem & Illingworth, 1993; Showers, 1992) found effects when they gave participants a questionnaire that asked them to consider the likelihood of specific negative scenarios. The advantage to using a questionnaire is that the researcher can manipulate the valence of the statements, and having participants consider negative scenarios and negative feelings resembles the type of reflection defensive pessimists typically engage in. The participants in this study simply wrote about their thoughts for five minutes, so they were free to consider positive or negative events. Strategic optimists' performance is supposed to be disrupted when they engage in negative reflection, but the nature of this reflectivity condition did not require their thoughts to be negative. In fact, as the results showed, their thoughts tended to be positive. Therefore, it is likely that the effect of reflectivity disrupting strategic optimists' performance was not replicated because the reflection did not resemble defensive pessimists' reflection (in other words, it was not negative). It is suggested that future studies use some form of guided reflection to ensure participants' thoughts will be negative in nature.

In summary, the previous effects of reflectivity on defensive pessimists' and strategic optimists' performance were not replicated, nor was the negative effect of an observer's high expectations on defensive pessimists' performance. Reflectivity is an essential part of the theory of defensive pessimism. Considering that other researchers have found significant effects of reflectivity (e.g., Norem & Illingworth, 1993; Spencer & Norem, 1996), the adequacy of the manipulations in the present study should be doubted before the accuracy of the theory. If the non-significant results were not caused by inadequate manipulations, another possible explanation is the small sample size. A quick look at the direction of the means in Figure 2 commands attention; the direction of defensive pessimists' average test scores hints at interesting



effects of observer expectancy and reflectivity that are simply waiting to be revealed. In other words, reflection may help or hurt defensive pessimists' performance depending on what type of expectation an observer holds for them, but stronger manipulations and a larger sample size will be necessary to better examine this question.

## REFERENCES

- Burger, J. M. (1989). Negative reactions to increases in perceived personal control. *Journal of Personality and Social Psychology*, 56(2), 246-256.
- Campbell, J. D., & Fairey, P. J. (1985). Effects of self-esteem, hypothetical explanations, and verbalizations of expectancies on future performance. *Journal of Personality and Social Psychology*, 48(5), 1097-1111.
- Dweck, C. S., & Gilliard, D. (1975). Expectancy statements as determinants of reactions to failure: Sex differences in persistence and expectancy change. *Journal of Personality and Social Psychology*, 32(6), 1077-1084.
- Eronen, S., Nurmi, J., & Salmela-Aro, K. (1998). Optimistic, defensive-pessimistic, impulsive and self-handicapping strategies in university environments. *Learning and Instruction*, 8(2), 159-177.
- Hirt, E. R., Deppe, R. K., & Gordon, L. J. (1991). Self-reported versus behavioral self-handicapping: Empirical evidence for a theoretical distinction. *Journal of Personality and Social Psychology*, 61, 981-991.
- Kolditz, T. A., & Arkin, R. M. (1982). An impression management interpretation of the self-handicapping strategy. *Journal of Personality and Social Psychology*, 43, 492-502.
- Leary, M. R., & Shepperd, J. A. (1986). Behavioral self-handicaps versus self-reported handicaps: a conceptual note. *Journal of Personality and Social Psychology*, 51, 1265-1268.

- Määttä, S., Stattin, H., & Nurmi, J. (2002). Achievement strategies at school: Types and correlates. *Journal of Adolescence*, 25, 31-46.
- Martin, A. J., Marsh, H. W., & Debus, R. L. (2001a). Self-handicapping and defensive pessimism: Exploring a model of predictors and outcomes from a self-protection perspective. *Journal of Educational Psychology*, 93(1), 87-102.
- Martin, A. J., Marsh, H. W., & Debus, R. L. (2001b). A quadripolar need achievement representation of self-handicapping and defensive pessimism. *American Educational Research Journal*, 38(3), 583-610.
- Martin, A. J., Marsh, H. W., & Debus, R. L. (2003). Self-handicapping and defensive pessimism: A model of self-protection from a longitudinal perspective. *Contemporary Educational Psychology*, 28, 1-36.
- Martin, A. J., Marsh, H. W., Williamson, A., & Debus, R. L. (2003). Self-handicapping, defensive pessimism, and goal orientation: A qualitative study of university students. *Journal of Educational Psychology*, 95(3) 617-628.
- Midgley, C., Arunkumar, R., & Urdan, T. C. (1996). "If I don't do well tomorrow, there's a reason": Predictors of adolescents' use of academic self-handicapping strategies. *Journal of Educational Psychology*, 88(3), 423-434.
- McCrea, S. M., & Hirt, E. R. (2001). The role of ability judgments in self-handicapping. *Personality and Social Psychology Bulletin*, 27(10), 1378-1389.
- Norem, J. K. (2001). Defensive pessimism, optimism, and pessimism. In E. C. Chang (Ed.), *Optimism & pessimism: Implications for theory, research, and practice*. Washington, DC: American Psychological Association.

- Norem, J. K., & Cantor, N. (1986a). Anticipatory and post hoc cushioning strategies: Optimism and defensive pessimism in “risky” situations. *Cognitive Therapy and Research*, 10(3), 347-362.
- Norem, J. K., & Cantor, N. (1986b). Defensive pessimism: Harnessing anxiety as motivation. *Journal of Personality and Social Psychology*, 51(6), 1208-1217.
- Norem, J. K., & Illingworth, K. S. S. (1993). Strategy-dependent effects of reflecting on self and tasks: Some implications for optimism and defensive pessimism. *Journal of Personality and Social Psychology*, 65, 822-835.
- Oleson, K. C., Poehlmann, K. M., Yost, J. H., Lynch, M. E., Arkin, R. M. (2000). Subjective overachievement: Individual differences in self-doubt and concern with performance. *Journal of Personality*, 68(3), 491-524.
- Sanna, L. J. (1996). Defensive pessimism, optimism, and simulating alternatives: Some ups and downs of prefactual and counterfactual thinking. *Journal of Personality and Social Psychology*, 71(5), 1020-1036.
- Sanna, L. J. (1998). Defensive pessimism and optimism: The bitter-sweet influence of mood on performance and prefactual and counterfactual thinking. *Cognition and Emotion*, 12(5), 635-665.
- Sherman, S. J., Skov, R. B., Hervitz, E. F., & Stock, C. B. (1981). The effects of explaining hypothetical future events: From possibility to probability to actuality and beyond. *Journal of Experimental Social Psychology*, 17, 142-158.
- Showers, C. (1992). The motivational and emotional consequences of considering positive or negative possibilities for an upcoming event. *Journal of Personality and Social Psychology*, 63(3), 474-484.

- Showers, C., & Ruben, C. (1990). Distinguishing defensive pessimism from depression: Negative expectations and positive coping mechanisms. *Cognitive Therapy and Research*, 14(4), 385-399.
- Spencer, S. M., & Norem, J. K. (1996). Reflection and distraction: Defensive pessimism, strategic optimism, and performance. *Personality and Social Psychology Bulletin*, 22(4), 354-365.
- Strube, M. J. (1986). An analysis of the self-handicapping scale. *Basic and Applied Social Psychology*, 7(3), 211-224.
- The Princeton Review. (2001). *Cracking the GRE* (2002 ed.). New York, NY: Princeton Review Publishing, L.L.C.

## Appendix A

### The Revised Defensive Pessimism Questionnaire (Norem, 2001)

When you answer the following questions, please think about how you prepare for and think about academic situations. Each of the statements below describes how people sometimes think or feel about these kinds of situations. Using the scale below, please indicate on the scantron how true it is of you, in academic situations.

---

1-----2-----3-----4-----5  
*Not at all* *Very true of me*  
*true of me*

1. I go into academic situations expecting the worst, even though I know I will probably do OK. **(PESS)**
2. I generally go into academic situations with positive expectations about how I will do. **(PESS-R)**
3. I've generally done pretty well in academic situations in the past. <sup>a</sup>
4. I carefully consider all possible outcomes before academic situations. **(REFL)**
5. I often worry, in academic situations, that I won't be able to carry through my intentions. **(PESS)**
6. I often think about how I will feel if I do very poorly in academic situations. **(REFL)**
7. I often think about how I will feel if I do very well in academic situations. **(REFL)**
8. I often try to figure out how likely it is that I will do very poorly in academic situations. **(REFL)**
9. I spend a lot of time planning when any kind of academic situation is coming up. **(REFL)**
10. I often try to figure out how likely it is that I will do very well in academic situations. **(REFL)**
11. In academic situations, sometimes I worry more about looking like a fool than doing really well. **(PESS)**
12. Prior to academic situations, I avoid thinking about possible bad outcomes. **(REFL-R)**
13. Considering what can go wrong in academic situations helps me to prepare. **(REFL)**

<sup>a</sup> "This item is included to differentiate between those who are realistically pessimistic and those who are defensively pessimistic, on the assumption that those who report having done very badly in the past are realistic when they anticipate doing badly in the future. In college student samples, typically fewer than 20% of respondents rate themselves below 5 [on a 7-point scale] on this item." (Norem, 2001, p. 83)

## Appendix B

### Sample Problem

#### GRADUATE RECORD EXAMINATION Analytical Section Practice

In a laboratory study, 160 rabbits in an experimental group were injected with Serum D, while 160 rabbits in a control group were injected with a harmless sugar solution. Within two weeks, 39% of the experimental group rabbits had contracted jungle fever, a highly contagious and usually fatal disease. Therefore, jungle fever must be caused by some substance similar to the substances found in Serum D.

The above argument would be most greatly strengthened if it were shown that

- (A) the normal rate of jungle fever among rabbits is .01%
- (B) 40% of the rabbits in the control group had also contracted jungle fever within two weeks
- (C) Serum D contains substances extracted from the root of a certain poisonous wildflower
- (D) the blood of jungle fever victims invariably contains a high level of certain toxic substances also found in Serum D
- (E) nearly all the rabbits who contracted jungle fever died within two days of the appearance of the first symptoms

Answer: D

## Appendix C

### Analytical Test

Selected from:

The Princeton Review. (2001). *Cracking the GRE* (2002 ed.). New York, NY: Princeton Review Publishing, L.L.C.

#1 - The greater the number of autonomous departments in a government, the more essential is a high level of cooperation. This is because increased numbers of autonomous departments demand a larger number of specialized policy makers, which leads to a greater burden on administrators and, possibly, to a greater number of difficulties in setting a general policy.

There are always greater numbers of autonomous departments in democratic governments than in centralized governments.

Which of the following statements must be true if all of the statements above are true?

- A) Difficulties in setting general policy occur more often in centralized governments than in democratic governments
- B) There are more specialized policy makers in centralized governments than in democratic governments.
- C) A high level of cooperation is more essential in democratic government than in centralized governments.
- D) An administrator's job is easier in a democratic government than in a centralized government.
- E) Autonomous departments operate with greater efficiency in democratic governments than in centralized governments.

Answer: C

#2 - Critics have recently called into question the authenticity of a painting, long believed to be the work of a famous artist, which they believe may have been executed by one of the artist's assistants. In order to determine the painting's authenticity, its visual patterns were compared to those in five works known to have been painted by the artist. Many patterns were examined, including composition and the prominence and width of brush strokes. The patterns displayed by the work in question were very similar to those in the five genuine works, thereby establishing the authenticity of the sixth painting.

Which of the following, if true, gives the strongest support to the conclusion above?

- A) The visual patterns displayed by different painters are not likely to be similar.
- B) Painters from different schools sometimes use the same composition and patterns of brush strokes, but do so to achieve different effects.
- C) Many painters endeavor to change their visual patterns with each painting, so as not to grow stale.
- D) The stock of visual patterns from which all painters draw is surprisingly limited, thereby insuring some overlap among the patterns displayed by different artists.
- E) Composition is not a reliable indicator of a painting's authenticity.

Answer: A

#3 - Medical researchers have recently suggested that candidates for heart bypass surgery actually achieve similar benefit by adopting a regimen of increased exercise and dietary changes, if maintained for a ten-year period. Although bypass surgery is now considered a relatively routine procedure, it still puts the patient at risk for heart failure during, or immediately following, the operation. Therefore, the performance of bypass surgery should be ceased.

Which of the following, if true, casts the most serious doubt on the conclusion drawn above?

- A) Patients undergoing bypass surgery can suffer aneurysms, stroke, or other potentially life-threatening afflictions.
- B) Almost all candidates for bypass surgery who do not alter their diets are at a significant risk of suffering a heart attack within five years.
- C) Although patients who undergo bypass surgery are often at risk for suffering heart attacks during or after the operation, most patients survive the procedure.
- D) Since the occurrence of heart attacks during and immediately following bypass surgery is rare, more people benefit from the surgery than are harmed by it.
- E) A regimen of exercise and dietary changes can be undertaken at little cost, whereas bypass surgery is an expensive procedure.



Answer: D

#4 - Last winter in a certain national forest one-sixth of the black bear population was unable to find appropriate dens for hibernation. This is somewhat curious given the fact that during the same period, the summer animals that had inhabited the dens during the autumn months had migrated. Many of the dens were large enough to accommodate the bears and were well insulated against the harsh winter weather.

Which of the following statements, if true, would best explain why the black bears were unable to find appropriate places to hibernate when there were ample dens available?

- A) Most of the dens which were left vacant were in the higher parts of the forest region and were therefore inaccessible to the bears who inhabit the lower region.
- B) During the winter, a few black bears continue to live in dens which they inhabited during the autumn months.
- C) Many of the dens are not conducive to the rearing of small cubs.
- D) A very few of the black bears migrate to a nearby animal preserve during the winter and therefore do not need to find dens within the national forest.
- E) The number of forest rangers who help the black bears to find dens for hibernation has been cut drastically in the last year.

Answer: A

#5 - Although I just had service performed on my car's engine, it is still not running well. During the service, the timing belt was replaced, and the fuel filter was checked and found to be sound. So the problem with the engine cannot be the timing belt or the fuel filter. Most cars of the same model and year as mine have experienced either timing belt slippage or water pump failure. Therefore, the problem with my engine must be a failing water pump.

The two underlined statements serve which of the following functions?

- A) The first statement provides a context for the argument, and the second statement serves as a premise supporting the main conclusion.
- B) The first statement is a premise that supports an intermediate conclusion, and the second statement is the main conclusion of the argument.
- C) The first statement is an intermediate conclusion that is refuted by the main conclusion, and the second statement is the main conclusion of the argument.
- D) The first statement is an intermediate conclusion that supports the main conclusion, and the second statement is the main conclusion of the argument.
- E) The first statement is the main conclusion of the argument, and the second statement is an intermediate conclusion that supports the main conclusion.

Answer: D

#6 - Johnstone contended that employee-owned companies would invariably be less productive than privately owned enterprises. Each individual, recognizing that his fellow employees would be working harder out of a sense of proprietorship, would be tempted to lighten his own workload. If each person follows this reasoning, overall productivity would greatly decrease. However, a study comparing 15 companies that had recently become employee-owned and 34 privately-owned companies revealed significantly better performance from the employee-owned companies.

The answer to which of the following questions would be most useful in evaluating the significance, in relation to Johnstone's claim, of the study described above?

- A) Did any of the companies studied switch from private to employee ownership in the middle of the fiscal year?
- B) Did investors assess employee-owned companies more favorably than they assessed privately owned companies?
- C) Were the employee-owned companies performing as well as the privately owned companies before they switched ownership to their employees?
- D) Were the employees of the employee-owned companies that were studied paid at least as much as the employees of the privately owned companies?
- E) Were there significant overlaps in the market interests of the employee-owned and privately owned companies?

Answer: C

For #s 7, 8, 9:

A fugue written for six instruments—bass, cello, flute, oboe, piano, and violin—calls for them to enter one by one into the composition. The instruments must enter according to the following conditions:

The piano enters fourth.

The cello enters immediately before the violin enters.

The bass enters sometime before the piano enters and sometime before the oboe enters.

The flute enters sometime before the oboe enters.

#7 - Which of the following is an acceptable order, from first to last, in which the instruments could enter?

- A) Bass, cello, violin, piano, flute, oboe
- B) Bass, flute, oboe, piano, violin, cello
- C) Bass, oboe, flute, piano, cello, violin
- D) Flute, cello, violin, piano, bass, oboe
- E) Flute, cello, violin, bass, piano, oboe

Answer: A

#8 - If the bass enters third, which of the following must be true?

- A) The flute enters first.
- B) The flute enters second.
- C) The oboe enters fifth.
- D) The violin enters second.
- E) The violin enters sixth.

Answer: D

#9 - If the violin enters sixth, which of the following can be true?

- A) The bass enters third.
- B) The cello enters second.
- C) The flute enters first.
- D) The flute enters fifth.
- E) The oboe enters second.

Answer: C

For #s 10, 11, 12:

A reading group is to choose exactly four books to be read by the group over the summer. The four books must be selected from among seven eligible books: three nonfiction works—P, Q, and R—and four fiction works—T, U, V, and W. The four books must be selected according to the following conditions:

If either Q or R is selected, the other must also be selected.

T and U cannot both be selected.

Q and V cannot both be selected.

#10 - Which of the following could be the four books selected by the reading group?

- A) P, Q, R, V
- B) P, Q, U, W
- C) P, U, V, W
- D) Q, T, U, W
- E) T, U, V, W

Answer: C

#11 - If P and T are both selected, which of the following pairs of books could be the other books selected?

- A) Q and U
- B) Q and W
- C) R and V
- D) U and V
- E) V and W

Answer: E

#12 - If R is selected, which of the following CANNOT be selected?

- A) P
- B) Q

- C) T
- D) V
- E) W

Answer: D

For #s 13, 14, 15:

A window dresser is designing a hat display for the window of a haberdasher. The display must include one of each of the following five types of hats: fedora, derby, top hat, sombrero, and beret. One hat will be displayed each day of a week, Monday through Friday. One of the hats displayed must be red, one must be cobalt, one must be brown, one must be white, and one must be gray. In designing the display, she has made the following decisions:

The derby will be displayed on an earlier day than the top hat.

The beret will be displayed on an earlier day than the fedora.

The white hat will be displayed on an earlier day than the gray hat.

The cobalt hat will be displayed on Wednesday.

The top hat displayed will be brown.

#13 - Which of the following could be the colors of the hats displayed on Monday through Friday, respectively?

- A) White, brown, cobalt, red, gray
- B) Red, cobalt, white gray, brown
- C) Red, brown, cobalt, gray, white
- D) Cobalt, gray, white, brown, red
- E) Brown, gray, cobalt, red, white

Answer: A

#14 - Any of the hats could be displayed on Wednesday EXCEPT the

- A) Fedora
- B) Derby
- C) Top hat
- D) Sombrero
- E) Beret

Answer: C

#15 If the fedora is displayed on an earlier day than the cobalt hat, which of the following must be true?

- A) The fedora is displayed on Monday.
- B) The derby is displayed on Tuesday.
- C) The top hat is displayed on Friday.
- D) The sombrero is displayed on Wednesday.
- E) The beret is displayed on Monday.

Answer: E

For #s 16, 17, 18:

A professor must decide which of seven graduate students—Jason, Katrina, Ling, Mitch, Nikita, Otto, and Pinter—to invite to a special seminar. Any combination of students is acceptable, but the following conditions must be met:

If Jason is invited, Katrina must be invited.

If Katrina and Mitch are both invited, Nikita cannot be invited.

If Mitch and Ling are both invited, Nikita cannot be invited.

If Ling is invited, either Otto or Pinter must be invited.

Nikita or Otto, but not both, must be invited.

Otto and Pinter cannot both be invited.

#16 - Which of the following is an acceptable group of students to invite?

- A) Jason, Katrina, and Pinter
- B) Mitch, Otto, and Pinter
- C) Katrina, Nikita, and Otto
- D) Mitch, Ling, and Otto
- E) Mitch, Ling, and Nikita

Answer: D

#17 - If Ling and Pinter are both invited, which of the following is true?

- A) Mitch must be invited
- B) Otto must be invited
- C) Nikita must be invited
- D) Jason cannot be invited.
- E) Katrina cannot be invited.

Answer: C

#18 - If Ling and Nikita are both invited, which of the following must be false?

- A) Pinter is invited.
- B) Mitch is invited.
- C) Jason is invited.
- D) Otto is not invited.
- E) Katrina is not invited.

Answer: B

For #s 19, 20, 21:

In a corporation, there are seven divisions—A, B, C, D, E, F, and G. These divisions send mail to each other in two ways: by messenger and by fax.

Mail sent by messenger can travel in only one direction, from A to B, from B to D, from D to F, from F to G, and from G to A. Mail sent by fax can travel in either direction between B and C, between C and G, and between D and E.

The seven divisions cannot send mail by any other means.

Mail that cannot be sent directly to the desired division is passed through one or more intermediate divisions, which pass the mail along according to the conditions stated above.

#19 - If division D sends mail to division C so that it passes through the fewest possible intermediate divisions, then which of the following must be the order of the intermediate divisions through which the mail passes?

- A) F, G, A, B
- B) F, B
- C) F, G
- D) B, C
- E) F, G, A

Answer: C

#20 - Mail sent from the first to the second division in which of the following pairs can be sent using exactly one intermediate division?

- A) A to F
- B) C to A
- C) D to B
- D) E to C
- E) G to E

Answer: B

#21 - Mail sent from the first to the second division in which of the following pairs requires using both the messenger and the fax?

- A) A to F
- B) C to G
- C) D to C
- D) E to D
- E) G to B

Answer: C

#22 - On the basis of a study it conducted, a research group concluded that managers in division A of a certain company authorize more discretionary spending than do managers in division B. These conclusions are based on an analysis of the number of non-budgeted expense reports that each manager approved.

The statistics used by the group will not be useful as a measure of which division spends more on non-budgeted expenses if which of the following is true?

- A) The group counts each expense report equally, regardless of the dollar value of the report.
- B) The group records all expenses, including those made by the managers themselves.
- C) Most expense reports submitted to managers for approval are in fact approved.
- D) Most non-budgeted expenses are incurred by the managers themselves.
- E) All non-budgeted expense reports are subject to approval by someone who works for neither division.

Answer: A

For #s 23, 24, 25:

Seven foods—A, B, C, D, E, F, and G—are to be chosen for the creation of a menu which is to include either three or four foods. A, B, C, and D are hot foods, and E, F, and G are cold foods. There must be at least one hot food and at least one cold food on the menu, but there cannot be an equal number of hot and cold foods. The entrée on the menu must be a food whose temperature is not the temperature of the majority of the other foods on the menu. The following conditions must also be met:

If A is on the menu, then D cannot be on the menu.

If B is on the menu, then E cannot be on the menu.

D and F cannot be on the menu unless they are both on the menu.

If G is on the menu, then E must be on the menu.

#23 - Which one of the following represents an acceptable menu?

- A) A, B, C
- B) C, E, G
- C) D, F, G
- D) A, C, D, F
- E) B, D, E, F

Answer: B

#24 - If B is on the menu, which one of the following must be true?

- A) There are three foods on the menu.
- B) There are four foods on the menu.
- C) B is the entrée on the menu.
- D) D is the entrée on the menu.
- E) F is the entrée on the menu.

Answer: E

#25 - Which one of the following could NOT be the entrée on the menu?

- A) C
- B) D
- C) E
- D) F
- E) G

Answer: E

## Appendix D

### Examples of Reflection Statements

#### **Negative feelings**

- "I might be a little nervous while taking the test because I know that I am not a very good test taker..."
- "However, I may become flustered or frustrated if I find the questions difficult."
- "I am worried I am going to be asked questions I cannot answer."
- "I am really nervous about what is going to be asked of me."
- "I am very scared about what kind of question I am going to see during the test."

#### **Positive feelings**

- "I think that I will feel fairly calm while taking the test."
- "...so I guess it's good that I am not that nervous."
- "I currently feel no pressure."
- "...but I am still not worried about it."
- "I'm not really nervous about it, and I don't even know if I will get the results back."

#### **Negative thoughts**

- "If I did poorly, I would feel a great sense of loss and not understand why I have so much trouble taking standardized tests."
- "I hope there is not math on this test."
- "The worst possible outcome of taking this test is not knowing any of the answers and failing it because that would make me feel embarrassed and pretty stupid."
- "During this test I think that I will lose concentration because I will be thinking about the time and how hard this is."
- "I do not feel too confident now, so I wonder how I will perform."
- "I would feel awful if I did poorly on the test."

#### **Positive thoughts**

- "Maybe it will help me be a better test taker if it reveals my strengths and weaknesses."
- "I am generally a proficient test taker, so I guess we'll see how this goes."
- "If I do well on this test, I will be happy, and confident about my performance."
- "If it was going okay, I would definitely relax."
- "There is no 'worst outcome'."
- "I think that I have a pretty good handle on test taking, generally, when I know the material, I have no problem with tests."
- "I think that I will do fairly well though, if the problems are based on logic, because I have a fairly analytic mind and am able to think things through pretty well."
- "The worst possible outcome I suppose is if I get no questions correct on the test, but I don't think that this will be happening, because I tend to do pretty well on tests, like I said."

#### **Subset: "...will have no effect..." "don't care" "won't feel bad if I do poorly"**

- "I guess it might be a good thing that I will never have to take this test, because I will not need any further schooling past my four years in undergraduate school."
- "...yet this still isn't a truly big deal since the test is geared for college graduates."

“Hopefully, I will know some, but it won’t be bad if I do not.”

“If I do poorly then I will be okay with it because that is why I am in college, to learn about the things that are on this test.”

“...but on the other hand, my score doesn’t really count or mean anything, other than just for this experiment.”

“So if I do not score well I will not really care.”

“But I didn’t prepare or even anticipate taking this test so it shouldn’t really matter.”

“...and I know that if I do bad on this it won’t hurt me in any way.”

### **Neutral**

“I have heard that this test is similar to an amped up version of an SAT test, so I would assume a lot of the same stereotypes could be applied.”

“I think the test will have various questions concerning applications of problem solving, and mathematical figures.”

“Sometimes, if it is a longer question, I might draw a picture or make some side notes to keep my focus on the main idea.”

“I don’t think I really have a feeling one way or the other on the test which could just be a result of my lack of sleep and inability to concentrate right now.”

“Will it be really challenging or will it come easily to me?”

### **Random**

“But you can’t measure intelligence, it’s so hard.”

“Critical thinking is a skill that does not come from a textbook, or from a professor lecturing.”

“Has it been 5 minutes yet?”

“Okay I just want to wait for the few minutes remaining.”

“Actually I bet I’m probably not even going to take a test and I’m just being tested on how people anticipate tests.”

“I woke up this morning having to urinate at five thirty AM.”

“I have decided to cut back on my "partying" because I am entering the Army soon.”

### **Hope**

“...but I will do my best and hopefully do well.”

“...it’s not a big concern, though I want to do well.”

“I hope I do not do worse than is expected.”

“...even if I started to get frantic I think I would still try to focus and probably do alright because adrenaline sometimes helps me...”

“I hope I do well, regardless.”